30^{00}

Operation and Installation Manual

ACM Series
Dehumidifying Dryers

Important! **Read Carefully Before Attempting to Install or Operate Equipment**

Part No. A0570044 **Revision *NEW*** **Bulletin No. WH1-620**

Write down your dehumidifying dryer serial numbers here for future reference

_____ _____

_____ _____

_____ _____

_____ _____

Performance figures stated in this manual are based on a standard atmosphere of 59°F (15°C) at 29.92" Hg (1,014 millibars) at sea level, using 60 hz power. Altitude is an important consideration when specifying dehumidifying dryers. AEC can advise you on proper selection and sizing of systems for your operating environment.

AEC is committed to a continuing program of product improvement. Specifications, appearance, and dimensions described in this manual are subject to change without notice.

Effective 7/11/2003
Part No. A0570044 Revision ***NEW*** Bulletin No. WH1-620

Table of Contents

1 General Information 9

1-1 Models Covered 9
1-2 Equipment Function 9
1-3 Necessary Documents 9
1-4 Standard Features 10
1-5 Options 10
1-6 The Drying System 12
1-7 Specifying a Drying System 14

2 Safety 15

2-1 Work Rules 15
2-2 Tools and Equipment Needed 15
2-3 Mechanical Installation 15
2-4 Safety Considerations 16
2-5 General Responsibility 17
2-6 Operator Responsibility 17
2-7 Maintenance Responsibility 19
2-8 Safety 20

3 Shipping Information 23

3-1 Unpacking and Inspection 23
3-2 In the Event of Shipping Damages 23
3-3 If the Shipment is Not Complete 24
3-4 If the Shipment is Not Correct 24
3-5 Returns 24

4 Installation 25

4-1 Work Rules 25
4-2 Rigging and Placing the Dryer 25
4-3 Making Electrical Connections 28
4-4 Making Dryer/Drying Hopper Process Air Connections 28
4-5 Drying Hopper Air Trap Considerations 29

5 Controls 31

5-1 Identifying Control Panel Indicator Lights and Switches for Standard Controller 31
5-2 Process Air Temperature Controller 33
5-3 Identifying Process Air Temperature Controller LED Indicators 34
5-4 Identifying Temperature Controller Keys 35
5-5 Setting the Process Air Temperature 35
5-6 Restoring the E5CN Temperature Controller to Factory Setup 36
5-7 Process Air Dew Point Display 38
5-8 Setting the High Dew Point Alarm 39
5-9 Restoring the E5CK Dew Point Meter to Factory Setup 39
5-10 Redundant Safety Controller Display 40
5-11 Setting the Redundant Safety Controller 40
5-12 Restoring the WATLOW Redundant Safety Controller to Factory Setup 40

Table of Contents

6 Control Operation 43
- 6-1 Controller Operation 43
  (Without Optional Alarm Horn & Reset Button) 43
- 6-2 Controller Operation 44
  (With Optional Alarm Horn & Reset Button) 44
- 6-3 Alarm Display Messages 46

7 Startup, Shutdown, and Operation 47
- 7-1 Pre-Startup Checks 47
- 7-2 Starting Up the Dryer 47
- 7-3 Shutting Down the Dryer 48

8 Maintenance 49
- 8-1 Work Rules 49
- 8-2 Servicing Process Air Filters 49
- 8-3 Servicing the Dew Point Monitor 52
- 8-4 Replacing the Process Heater 52

9 Troubleshooting 55

10 Dryer Options 58

11 Spare Parts 59
- 11-1 Spare Parts List 59

12 Technical Assistance 61
- 12-1 Contact Information for Technical Assistance 61
- 12-2 Returned Material Policy 62
- 12-3 Warranty 63

13 Safety Tag Information 65
- 13-1 ACM Dryer Safety Tags 65
- 13-2 Dryer Identification (Serial Number) Tag 66

Safety Considerations

AEC ACM Series membrane dryers are designed to provide safe and reliable operation when installed and operated within design specifications, following national and local safety codes.

To avoid possible personnel injury or equipment damage when installing, operating, or maintaining this equipment, use good judgment and follow these safe practices:

- ☑ Follow all **SAFETY CODES.**
- ☑ Wear **SAFETY GLASSES** and **WORK GLOVES.**
- ☑ Disconnect and/or lock out power before servicing or maintaining the dryer.
- ☑ Use care when **LOADING, UNLOADING, RIGGING,** or **MOVING** this equipment.
- ☑ Operate this equipment within design specifications.
- ☑ **OPEN, TAG,** and **LOCK ALL DISCONNECTS** before working on this equipment. It is a good idea to remove the fuses and carry them with you
- ☑ Make sure the dryer and components are properly **GROUNDED** before switching on power.
- ☑ Do not jump or bypass any electrical safety control.
- ☑ Do not restore power until all tools, test equipment, etc. have been removed and the dryer and allied equipment are fully reassembled.
- ☑ Only **PROPERLY TRAINED** personnel familiar with the information within this manual should work on this equipment.

AEC

“ACM” Series
Membrane Dryers

This dryer is manufactured by ACS, Inc. at the ACS-Wood Dale facility:

ACS, Inc.
801 AEC Drive
Wood Dale, IL 60191

Phone: 630.595.1060
Fax: 630.595.6641

The equipment is distributed in Europe by our European facility:

ACS-EUROPE
Daniels Industrial Estate
BATH ROAD
Stroud, Gloucestershire, England
GL5 3TJ

Phone: (44) 1453 768980
Fax: (44) 1453 768990

Annex B Information

The following design information is provided for your reference:

1. No modifications are allowed to this equipment that could alter the CE compliance
2. Ambient temperature: 40 degrees Celsius – Maximum (104 degrees Fahrenheit)
3. Humidity range: 50% relative humidity
4. Altitude: Sea level
5. Environment: Clean, dust-free and non-explosive
6. Radiation: None
7. Vibration: Minimal, i.e. machine mounting
8. Allowable voltage fluctuation: +/- 10%
9. Allowable frequency fluctuation: Continuous +/- 1%
   Intermittent +/- 2%
10. Nominal supply voltage: 460/3/60 (Verify on serial number tag)
11. Earth ground type: TN (system has one point directly earthed through a protective conductor)
12. Power supply should include a ground connection.
13. Over-current protection is supplied in the dryer, but additional protection should be supplied by the user.
14. The door-mounted disconnect serves as the electrical disconnect device.
15. Dryer is not equipped with local lighting.
16. Functional identification
17. Dryer is equipped with a CE mark
18. Dryer is supplied with an operating manual in the language of the destination country.
19. Cable support may be required for power cord, depending on final installation.
20. No one is required to be in the interior of the electrical enclosure during the normal operation of the unit. Only skilled electricians should be inside the enclosure for maintenance.
21. Doors can be opened with a screwdriver, but no keys are required.
22. Two-hand control is not required or provided.
23. All dryers should be moved around and set in a place with a lift truck or equivalent.
24. There are no frequent repetitive cycles that require manual control—repetitive functions are automatic while the dryer is operating.
25. An inspection report detailing the functional test is included with the dryer.
26. The machine is not equipped with cableless controls.
27. Color-coded (harmonized) power cord is sufficient for proper installation.

Charts and Figures

1	Typical ACM Dryer Components	11
2	Typical Dryer Air Flow Schematic	12
3	ACM Series Machine-Mount Dimensions	13
4	ACM Series Floor-Mount Dimensions	14
5A	Suggested Lift Rigging for ACM Dryers (Cart Mount)	26
5B	Suggested Lift Rigging for ACM Dryers (Floor Mount)	27
5C	Suggested Lift Rigging for ACM Dryers (Machine Mount)	27
6	Typical Control Panel	32
7	Typical Temperature Controller	33
8	Setting List for Process Temperature Controller	38
9	Typical Dew Point Display Monitor	39
10	Typical Redundant Safety Controller Display	40
11	Setting List for Redundant Safety Controller (WATLOW)	42
12	Process Heater Location & Disassembly	53
13	Level 1 Spare Parts List (Electrical & Mechanical)	59
14	Level 2 & 3 Spare Parts List (Electrical & Mechanical)	60

General Information 1

1-1 Models Covered

This manual provides instructions for installing and operating AEC ACM30 and ACM60 membrane dryers. The number designation represents air flow capacity. ACM30 models have a 30 cfm air flow capacity, and ACM60 models have a 60 cfm capacity.

1-2 Equipment Function

AEC membrane mini dryers are designed to generate heated, dehumidified air at carefully controlled temperatures for use in plastic drying systems. Drying systems are sized to meet the specific requirements stated by the purchaser at the time of purchase.

Moisture removal from hygroscopic (moisture attracting) plastic pellets is an essential step in the manufacture of high-quality plastic products.

AEC dehumidifying dryers are used to generate very low dew point air heated to a controlled temperature for drying plastic pellets and regrind.

1-3 Necessary Documents

The documents listed below are necessary for the operation, installation, and maintenance of AEC ACM30 through ACM60 dryers. Additional copies are available from AEC, Inc.

Familiarize the appropriate personnel with these documents:

- ☑ This manual.
- ☑ The schematic and assembly drawings included in the customer information packet.
- ☑ The Customer Parts List included in the information packet.
- ☑ Operation and installation manuals for any optional controls or auxiliary equipment in the drying system.

1-4 Standard Features

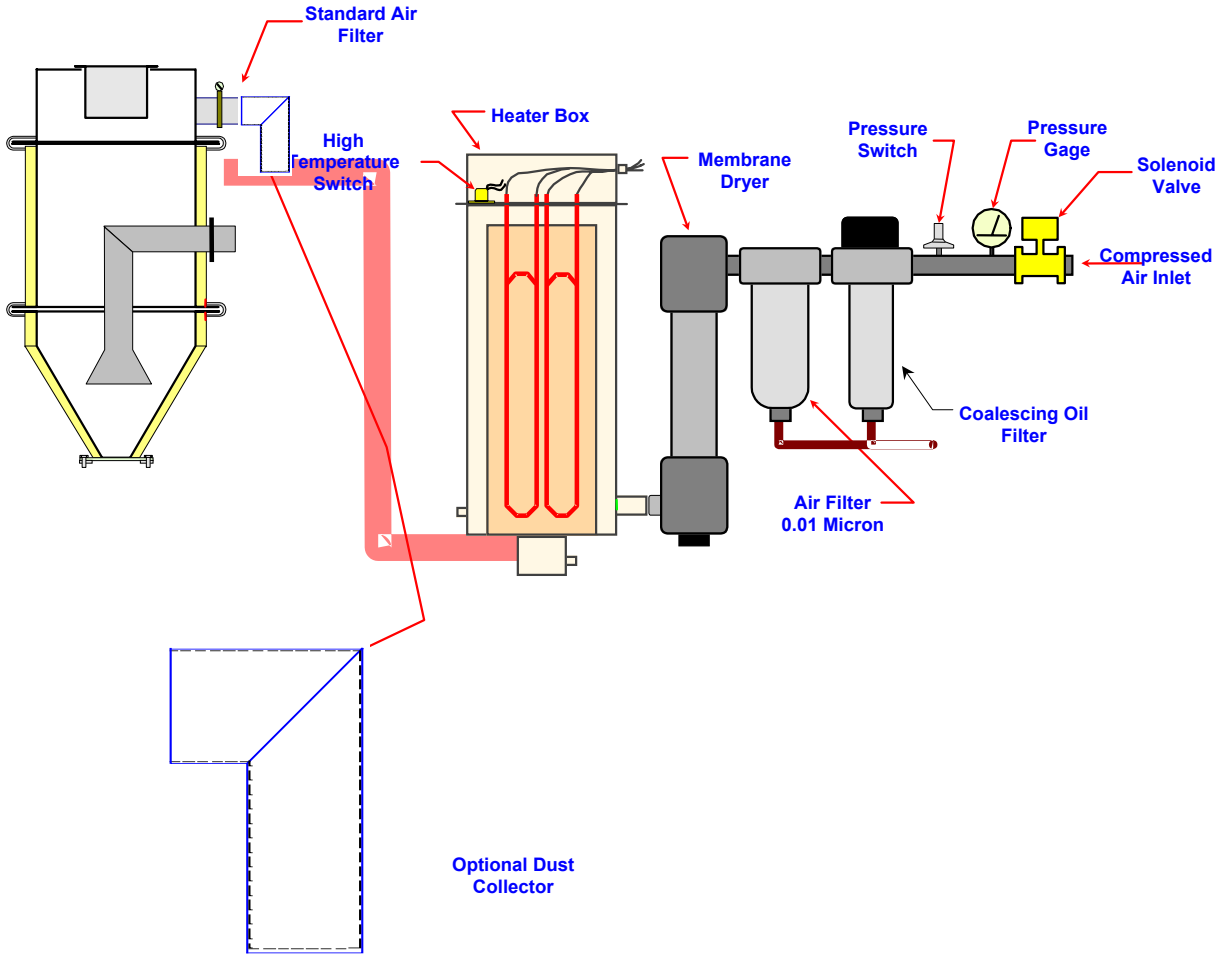
- ☑ Electrical solenoid valve
- ☑ Drying temperature range of 160ºF to 400ºF.
- ☑ Mitsubishi programmable relay controller
- ☑ Display of process temperature set point and actual settings
- ☑ Process thermocouple to be connected to drying hopper air inlet.
- ☑ Nema 12 control enclosure
  - NFPA79 machinery electrical standards
  - Non-fused electrical disconnect
  - Branch fusing
  - Mercury process heater contactor
  - Regeneration temperature control
  - Process high temperature alarm light
  - Process/regeneration heater box
  - High temperature safety system (Process/Regeneration)

1-5 Options

Options can tailor your AEC dehumidifying dryer to meet the exact requirements of the drying task being performed.

- ☑ Process temperature up to 400ºF (or below 160ºF), including pyrex sight glass and silicone insulated delivery hose.
- ☑ If the dryer is a central dry air generator, it will not have a process heater box.
- ☑ Machine mount adapter to accommodate a dryer and corresponding hopper.
- ☑ Drawer magnet, stainless steel construction.
- ☑ Casters, two (2) fixed and two (2) swivel.

Figure 1
Typical ACM Dryer Components



1-6 The Drying System

AEC Membrane Compressed air dryers, take a small percentage of the dried gas and direct it back in a sweeping pattern through the module shell. This provides a driving force to remove the moisture with the minimum purge required.

The Moisture Vent Compressed Air Dryer, consists of thousands of hollow-fiber membranes made of tough temperature and pressure resistant plastic. The inside surface of these hollow fibers is coated with an ultra-thin layer of a second plastic that performs the actual water-vapor from air separation. This second coating allows air to pass through it over 20,000 times easier than it allows water to pass. As a result, moisture is expelled rapidly with very little air loss. Two-stage drying provides the option of using the Moisture Vent directly at the point-of-use in combination with a refrigerated air dryer.

As a single stage unit, the dryer provides consistent performance from 60°F to -20°F outlet dew point. When combined with a refrigerated air dryer, the Moisture Vent system will suppress or reduce the inlet pressure dew point to below -40°F with very low sweep requirements.

Figure 2
Typical Dryer Air Flow Schematic

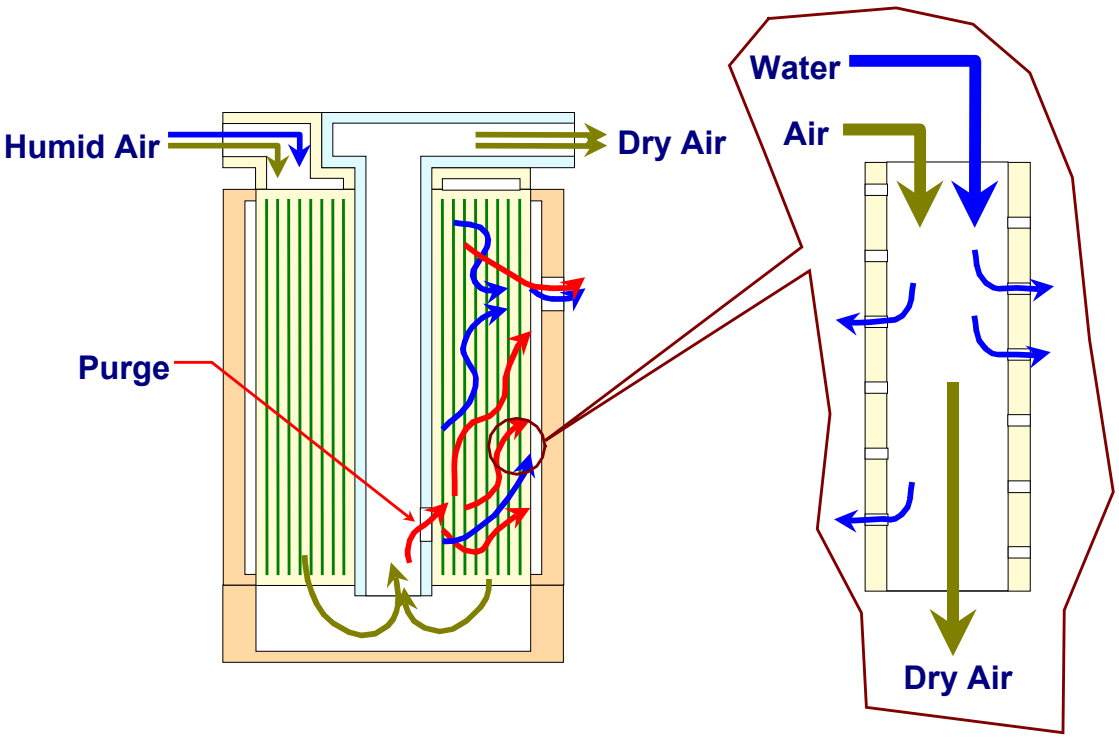
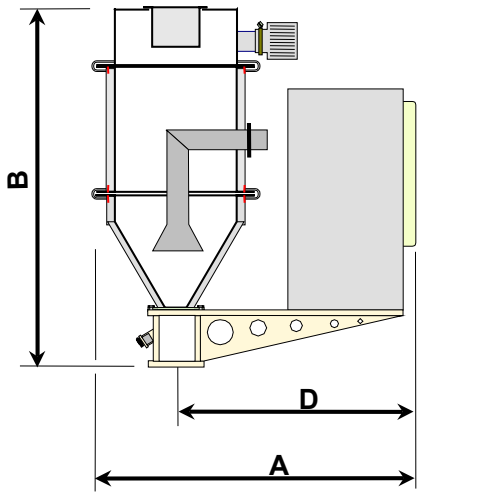
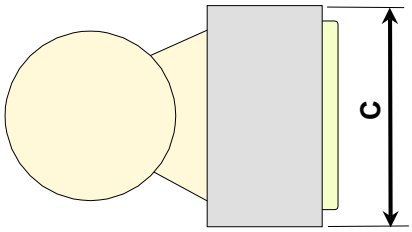
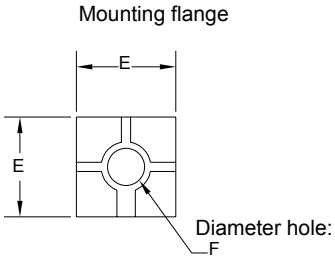


Figure 3
ACM Series Machine-Mount Dimensions





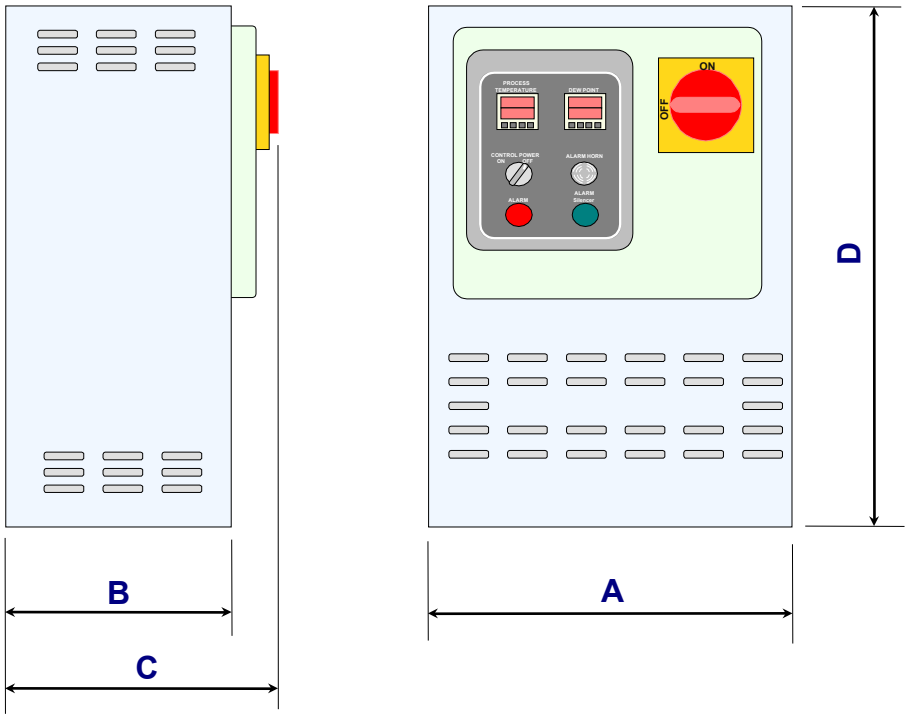


Notes: Hopper mounting flanges on 0.75 and and 1.5 cu. ft. (20 & 40 liter) hoppers are supplied blank so the customer can drill to match existing machine throat.

3.0 cu. ft. (80 liter) hoppers and larger **are not supplied with a cast flange** (as shown).

ACM30 and ACM60 machine-mount dimensions in inches/cm												
	ACM30						ACM60					
	1.5 ft.^{3} Hopper (40 liters)		3.0 ft.^{3} Hopper (80 liters)		4.0 ft.^{3} Hopper (120 liters)		3.0 ft.^{3} Hopper (80 liters)		4.0 ft.^{3} Hopper (120 liters)		6.0 ft.^{3} Hopper (160 liters)	
Dimension	**in.**	**cm**	**in.**	**cm**	**in.**	**Cm**	**in.**	**cm**	**in.**	**cm**	**in.**	**cm**
A	40	102	40	102	40	102	47	119	47	119	47	119
B	37.5	95	44.5	113	50.5	128	44.5	113	50.5	128	62.5	159
C	22	56	22	56	22	56	25	64	25	64	25	64
D	28	71	28	71	28	71	38	97	38	97	38	97

Figure 4
ACM Series Floor-Mount Dimensions



ACM30 and ACM60 floor-mount dimensions in inches/cm				
Dimension	ACM30		ACM60	
	in.	cm	in.	cm
A	22	56	25	64
B	12.75	32	12.75	32
C	15.5	39	15.5	39
D	28	71	28	71

1-7 Specifying a Drying System

Many variables were considered in the selection of your drying system, including type of materials, residence time, throughput of the extruder or injection molding machine. Should your operating environment change, AEC can advise you on necessary equipment and process time and temperature modifications required for your system.

2-1 Work Rules

Install, operate, and maintain this equipment according to applicable work and safety codes for your location. This includes OSHA, CE, NEC, CSA, SPI, and many other local, national, and international regulations. Obey these specific work rules:

☑ Read and follow the instructions in this manual before installing, operating, or maintaining any equipment. Additional copies are available from AEC, Inc.

☑ Only qualified persons should work on, or with, this equipment.

☑ Work only with approved tools and devices.

☑ Disconnect and lock out power while working on this equipment.

2-2 Tools and Equipment Needed

You'll need the following:

- Hand tools
- Fork lift or overhead lift
- Wire, conduit, and fittings for wiring runs (if receptacle is not already in place)
- Mounting bolts with nuts and washers

2-3 Mechanical Installation

Dryers may be mounted on the machine, a stand, or a mezzanine. Be sure it is securely attached and additional bracing is used if necessary. The sections on the following pages explain general installation rules.

Read manual thoroughly before installing dryer.

Use approved safety straps or chains to lift the dryer at the marked lifting points.

2-4 Safety Considerations

The terms **NOTICE, CAUTION, WARNING**, and **DANGER** have specific meanings in this manual. ***See Section 13 for a complete list of specific safety warning information***.

A **NOTICE** is used to indicate a statement of company policy directly or indirectly related to the safety of personnel or protection of property.

A **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

A **WARNING** indicates a potentially hazardous situation which, if not avoided could result in death or serious injury.

A **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This word will be limited to the most serious situation(s).

The term **IMPORTANT** emphasizes areas where equipment damage could result, or provides additional information to make a step or procedure easier to understand. Disregarding information marked **IMPORTANT** would not be likely to cause personal injury.

REPORTING A SAFETY DEFECT

NOTE: If you believe that your equipment has a defect which could cause injury, you should immediately discontinue its use and inform AEC, Inc., at our address listed in this manual.

The principle factors which can result in injury are:

1. Failure to follow proper operating and clean-out procedures, i.e. lockout/tagout.
2. Failure to maintain a clean and safe working environment.

2-5 General Responsibility

NO MATTER WHO YOU ARE…

Safety is important. Owners, operators, and maintenance personnel must realize that every day, safety is a vital aspect of their jobs.

If your main concern is loss of productivity, remember this: **Production is always affected in a negative way following an accident.** The following are some of the reasons, which can affect your production:

- **Loss of a skilled operator (temporarily or permanently)**
- **Breakdown of shop morale**
- **Costly damage to equipment**
- **Down-time**

An effective safety program is responsible and economically sound.

Organize a safety committee or group, and hold regular meetings. Promote this group from the management level. Through this group, the safety program can be continually reviewed, maintained, and improved. Keep minutes or a record of the meetings.

Hold daily equipment inspections in addition to regular maintenance checks. You will keep your equipment safe for production and exhibit your commitment to safety.

Please read and use this manual as a guide to equipment safety. This manual contains safety warnings throughout, specific to each function and point of operation.

2-6 Operator Responsibility

The operator's responsibility does not end with efficient production. The operator usually has the most daily contact with the dryer and intimately knows its capabilities and limitations.

Plant and personnel safety is sometimes forgotten in the desire to meet incentive rates, or through a casual attitude toward machinery formed over a period of months or years. Your employer probably has established a set of safety rules in your workplace. Those rules, this manual, or any other safety information will not keep you from being injured while operating your equipment.

ONLY YOU can make safety work for you by constantly thinking about what is safe and what is not. It is often the "just once" that an operator reaches into a dryer to remove material and it results in serious injury.

Learn and always use safe operation. Cooperate with co-workers to promote safe practices. Immediately report any potentially dangerous situation to your supervisor or appropriate person.

REMEMBER:

- **NEVER** place your hands or any part of your body in any dangerous location.
- **NEVER** operate, service, or adjust the dryer without appropriate training and first reading and understanding this manual.
- **NEVER** try to pull material out of the dryer with your hands while it is running!
- Before you start the dryer check the following:
    - Remove all tools from the dryer;
    - Be sure no objects (tools, nuts, bolts, clamps, bars) are laying in the hopper area;
- If your dryer has been inoperative or unattended, check all settings before starting the unit.
- At the beginning of your shift and after breaks, verify that the controls and other auxiliary equipment are functioning properly.
- Keep all safety guards in place and in good repair. **NEVER** attempt to bypass, modify, or remove safety guards. Such alteration is not only unsafe, but will void the warranty on your equipment.
- When changing control settings to perform a different mode of operation, be sure selector switches are correctly positioned. Locking selector switches should only be adjusted by authorized personnel and the keys removed after setting.
- Report the following occurrences **IMMEDIATELY:**
- unsafe operation or condition
    - unusual dryer action
    - leakage
    - improper maintenance
    - **NEVER** stand or sit where you could slip or stumble into the dryer while working on it.
- **DO NOT** wear loose clothing or jewelry, which can be caught while working on a dryer. In addition, cover or tie back long hair.

- Clean the dryer and surrounding area **DAILY**, and inspect the machine for loose, missing or broken parts.
- Shut off power to the dryer when it is not in use. Turn the switch to the **OFF** position, or unplug it from the power source.

2-7 Maintenance Responsibility

Safety is essential to the good health of both operator and machine. If you are a maintenance worker, you must make safety a priority in order to effectively repair and maintain equipment.

BEFORE REMOVING, ADJUSTING, OR REPLACING PARTS ON A MACHINE, REMEMBER TO DO THE FOLLOWING:

- **TURN OFF** all air and electric supplies and all accessory equipment at the machine.
- **DISCONNECT AND LOCK OUT** electrical and pneumatic power, and attach warning tags to the disconnect switch and air shutoff valve.

When you need to perform maintenance or repair work on a dryer above floor level, use a solid platform or a hydraulic elevator. If there is a permanently installed catwalk on your dryer, use it. The work platform should have secure footing and a place for tools and parts. **DO NOT** climb on dryers, machines, or work from ladders.

If you need to repair a large component, use appropriate handling equipment. Before you use handling equipment (portable "A" frames, electric boom trucks, fork trucks, overhead cranes) be sure the load does not exceed the capacity of the handling equipment or cause it to become unstable.

Carefully test the condition of lifting cables, chains, ropes, slings, and hooks before using them to lift a load.

Be sure that all non-current carrying parts of electrical apparatus, electrical component enclosures, and the dryer frame are correctly connected to earth ground with an electrical conductor that complies with current codes. Install in accordance with national and local codes, which apply.

When you have completed the repair or maintenance procedure, check your work, remove your tools, rigging, and handling equipment.

Do not restore power to the dryer until all persons are clear of the area. **DO NOT** start and run the dryer until you are sure all parts are functioning correctly.

BEFORE you turn the dryer over to the operator for production, verify all dryer enclosure panels, guards and safety devices are in place and functioning properly.

2-8 Safety

2-8-1 Description and Objectives

This section includes information on safety devices and procedures that are inherent to the ACM Dryer. This manual is not intended to supersede or alter safety standards established by the user of this equipment. Instead, the material contained in this section is recommended to supplement these procedures in order to provide a safer working environment.

At the completion of this section, the operator and maintenance personnel will be able to:

- ***Identify and locate specific safety devices.***
- ***Understand the proper use of the safety devices provided.***
- ***Describe the function of the safety devices.***

2-8-2 Safety Circuit Standards

Safety circuits used in industrial systems protect the operator and maintenance personnel from dangerous energy. They also provide a means of locking out or isolating the energy for servicing equipment.

Various agencies have contributed to the establishment of safety standards that apply to the design and the manufacture of automated equipment. The Occupational Safety and Health Administration (OSHA) and the Joint Industrial Council (JIC) are just a few of the organizations that have joined with the plastics industry to develop safety standards.

Every effort has been made to incorporate these standards into the design of the ACM Dryer; however, it is the responsibility of the personnel operating and maintaining the equipment to familiarize themselves with the safety procedures and the proper use of any safety devices.

2-8-3 Fail Safe Operation

If a safety device or circuit should fail, the design must be such that the failure causes a "Safe" condition. As an example, a safety switch must be a normally open switch. The switch must be held closed with the device it is to protect. If the switch fails, it will go to the open condition, tripping out the safety circuit.

At no time should the safety device fail and allow the operation to continue. For example, if a safety switch is guarding a motor, and the safety switch fails, the motor should not be able to run.

2-8-4 Safety Device Lock-Outs

Some safety devices disconnect electrical energy from a circuit. The safety devices that are utilized on ACM models are primarily concerned with the pneumatics and electrical power disconnection, and the disabling of moving parts that may need to be accessed during the normal operation of the machine.

Some of the safety devices utilize a manual activator. This is the method of initiating the safety lock out. This may be in the form of a plug, disconnect plug, lever or a handle. Within this lockable handle, there may be a location for a padlock. Personnel servicing the equipment should place a padlock in the lockout handle.

WARNING! **Always disconnect and lockout all electrical power and pneumatic (i.e. compressed air) sources prior to servicing or cleaning any Dryer, including all ACM units. Failure to do so may result in serious injury.**

At no time must *anyone* remove the lockout or reconnect the twist plug, other than the person who installed the lockout or who unplugged the twist plug.

2-8-5 Lock-Outs, Plugs, and Other Safety Devices

The ACM Dryer utilizes several types of safety devices.

The Line Cord Plug

This line cord plug allows the operator or maintenance personnel to unplug the dryer from its power source and tag it out. This plug may be tagged with any number of approved electrical lockout tags. These tags are available at most electrical supply stores.

WARNING!

Disconnect both of these items to ensure optimum maintenance personnel safety when cleaning or servicing this equipment.

-Notes-

Shipping Information 3

3-1 Unpacking and Inspection

You should inspect your AEC dehumidifying dryer for possible shipping damage. If the container and packing materials are in re-usable condition, save them for reshipment, if necessary.

Thoroughly check the equipment for any damage that might have occurred in transit, such as broken or loose wiring and components, loose hardware and mounting screws, etc. In case of breakage, damage, shortage, or incorrect shipment, refer to the following sections.

3-2 In the Event of Shipping Damages

Important!

According to the contract terms and conditions of the Carrier, the responsibility of the Shipper ends at the time and place of shipment.

- ☑ Notify the transportation company's local agent if you discover damage.
- ☑ Hold the damaged goods and packing material for the examining agent's inspection. **Do not return any goods to AEC, Inc. before the transportation company inspection and authorization**.
- ☑ File a claim against the transportation company. Substantiate the claim by referring to the agent's report. A certified copy of our invoice is available upon request. The original Bill of Lading is attached to our original invoice. If the shipment was prepaid, write us for a receipted transportation bill.
- ☑ Advise AEC, Inc. regarding your wish for assistance and to obtain an RMA (return material authorization) number.

3-3 If the Shipment is Not Complete

Check the packing list. The apparent shortage may be intentional. Back-ordered items are noted on the packing list. You should have:

- ☑ ACM Series dryer
- ☑ Bill of lading
- ☑ Packing list
- ☑ Operating and Installation packet
- ☑ Electrical schematic and panel layout drawings
- ☑ Component instruction manuals

Re-inspect the container and packing material to see if you missed any smaller items during unpacking. Determine that the item was not inadvertently taken from the area before you checked in the shipment. Notify AEC, Inc. immediately of the shortage.

3-4 If the Shipment is Not Correct

If the shipment is not what you ordered, **contact AEC, Inc. immediately**. For shipments in the United States and Canada, call 1 (630) 475-7143; for all other countries, call 001 (630) 475-7143. Include the order number and item.
Hold the items until you receive shipping instructions.

3-5 Returns

Important!

Do not return any damaged or incorrect items until you receive shipping instructions from AEC, Inc.

4-1 Work Rules

The installation, operation, and maintenance of this equipment must be conducted in accordance with all applicable work and safety codes for the installation location. This may include, but is not limited to, OSHA, NEC, CSA, and any other local, national, and international regulations.

- Read and follow these operating instructions when installing, operating, and maintaining this equipment. If the instructions become damaged or unreadable, you can obtain additional copies from AEC.
- Only qualified personnel familiar with this equipment should work on or with this dryer.
- Work with approved tools and devices.
- Disconnect the electricity before maintenance or service. If the dryer is installed with a power cord that can be unplugged, unplug it. If the dryer is permanently wired to a power main, you must install a fused power disconnect to allow the disconnect to be locked in the OFF position. Open and lock out the disconnect installed in the control enclosure.

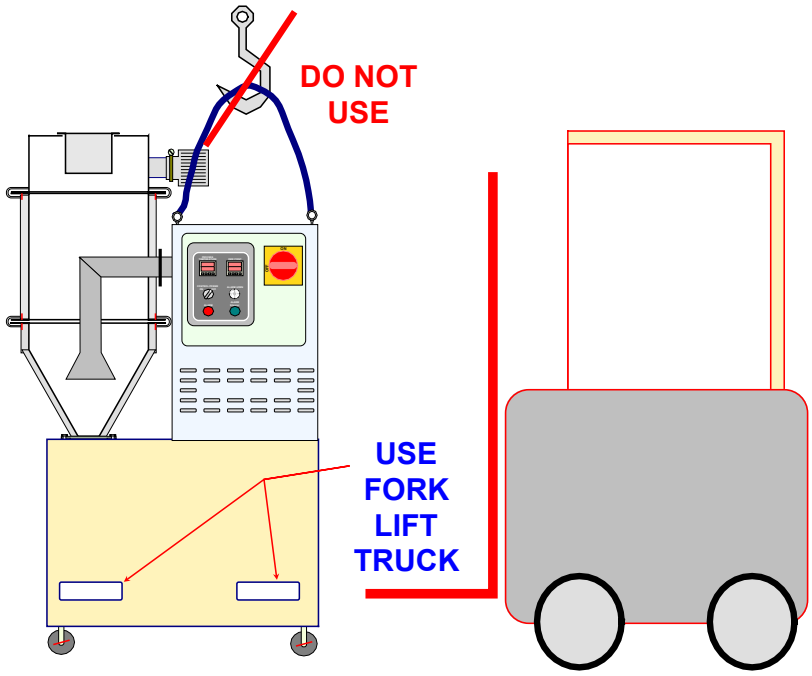
4-2 Rigging and Placing the Dryer

Take care when rigging and placing the dryer. Figures 4A, 4B, and 4C on the following pages show a suggested safe rigging diagram. It lets you lift the dryer/hopper unit vertically for installation on the machine throat. Adjust chain lengths at the center sling bracket before you lift the unit. Your dryer has built-in lifting lugs.

CAUTION!

- **If you are mounting an ACM machine-mount dryer with a magnet or transition adaptor on the machine throat, *you must provide additional support* to hold the dryer securely on the machine.**
- **Be aware that off-center static and dynamic hopper loading can occur with machine vibration. Again, *provide additional support* to hold the dryer securely on the machine.**
- **For ACM60 dryer units, you must provide additional support to stabilize these units and to protect personnel when installing on machine throats.**
- **Use caution and observe safety rules when lifting and placing your dryer!**

Figure 5A
Suggested Lift Rigging for ACM Dryers (Cart Mount)

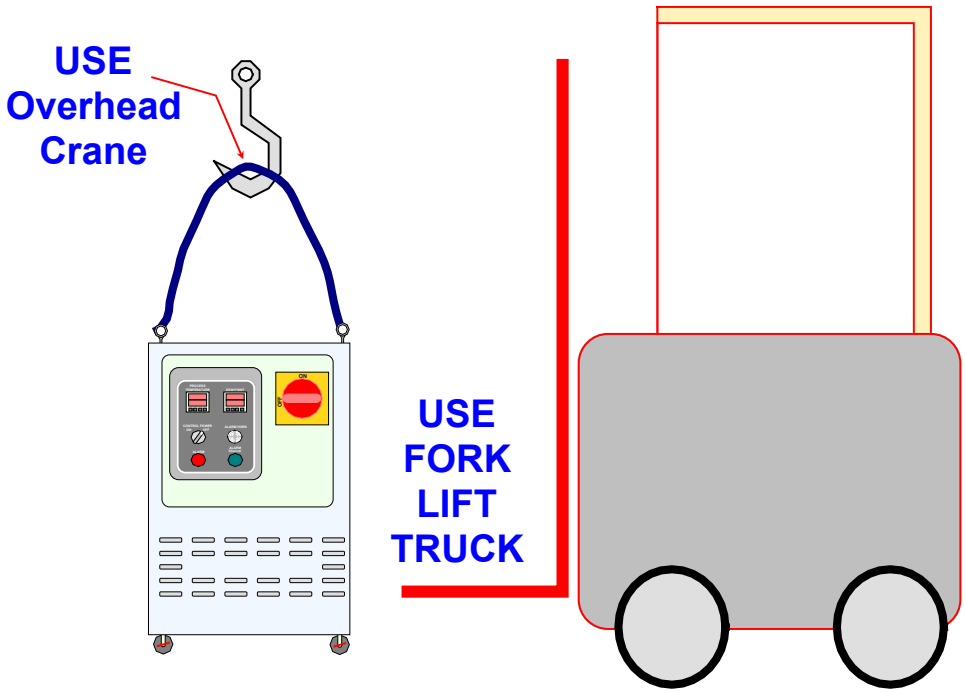


Important!

Do not use a hoist to move or rig your ACM Dryer when it is mounted on a cart! Moving the Dryer with a hoist will cause it to become unstable and may cause damage to the Dryer and/or injury to personnel!

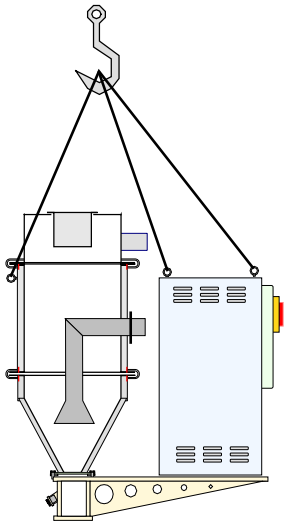
Item	Quantity	Description	Vendor	Vendor part no.
1	1	Adjustable alloy chain sling	McMaster-Carr	33665T32
2	2	Existing hopper lifting bracket	—	—
3	1	Drop forged steel eye nut	McMaster-Carr	3019T15
4	1	Chain connector	McMaster-Carr	3712T23

Figure 5B
Suggested Lift Rigging for ACM Dryers (Floor Mount)



Note: Floor Mounted Dryers can be lifted by hoist or fork lift.

Figure 5C
Suggested Lift Rigging for ACM Dryers (Machine Mount)



Important!

When using a hoist to move a machine mounted dryer, ALWAYS attach chains to the three (3) locations/lifting points on the unit! Moving the Dryer without the chains attached to all of the lifting points will cause the unit to become unstable and may cause damage to the Dryer and/or injury to personnel!

4-3 Making Electrical Connections

- ☑ The serial tag lists voltage, phase, and amp draw information.
- ☑ Line voltage must be within plus or minus ten percent (±10%) of the voltage listed on the serial tag, or damage may occur. Phase imbalance must be less than two percent (2%).
- ☑ Fulfill all national, state, and local safety and electrical code requirements.
- ☑ A qualified electrician should make all electrical connections.
- ☑ Make sure all electrical connections are tight.
- ☑ Connect main power to the dryer at the disconnect or terminals in the upper right corner of the control enclosure.
- ☑ Install a fused disconnect with a lockout feature in the power main leading to the dryer.
- ☑ The power drop must include a ground wire.

ACM30 and ACM60 Electrical Schematics

Refer to your Customer Information Packet on actual drawings for your specific dryer.

4-4 Making Dryer/Drying Hopper Process Air Connections

Floor Mount Models

- ☑ Use high-temperature flexible dryer hose or rigid tubing to connect the dryer to the drying hopper.
- ☑ Keep the delivery hose to the drying hopper as short as possible to minimize heat loss. We strongly recommend insulated hose for maximum energy savings.
- ☑ Make sure that hoses are not kinked or collapsed.
- ☑ Drying hopper air inlet and outlet locations vary, but always connect hoses so the dry process air from the dryer enters the bottom of the drying hopper and flows out the top to return to the dryer inlet.

4-5 Drying Hopper Air Trap Considerations

AEC's exclusive air trap assembly on the top of the drying hopper prevents ambient air from contaminating the material being dried.

- ☑ Keep the material level at the mid point of the air trap for the dryer to operate efficiency.
- ☑ Use a hopper loader or vacuum conveying system to maintain the proper material level.

- Notes -

- Notes -

5-1 Identifying Control Panel Indicator Lights and Switches for Standard Controller

Switches

System OFF/ON/START Switch

The **OFF/ON/START** switch energizes or de-energizes control power to the indicator panel and starts the dryer. (The controller can be energized without the dryer running.)

Optional Alarm Silence Switch

Press the **ALARM SILENCE** switch to silence the horn when a high temperature process/ regeneration or blower failure alarm activates.

Indicator Lights

Alarm Light

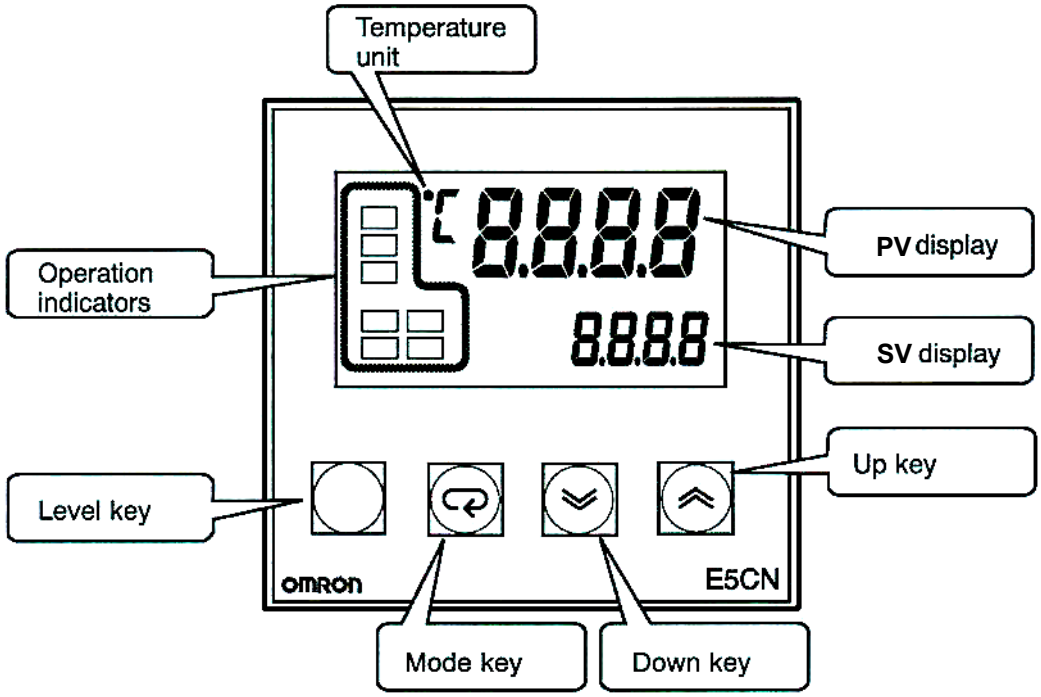
This feature works in conjunction with the alarm horn to warn the operator of a high bed safety temperature, a regeneration heater fault, or a blower failure. This warning is reset by pressing the alarm silence button.

Figure 6
Typical Control Panel

5-2 Process Air Temperature Controller

AEC dryers use a microprocessor-based PID temperature controller for maintaining process air temperature. The controller is a modular, self-contained unit you can remove from the mounting housing. All parameters except for the process air set point are factory set and adjusted; normally, no field adjustment to the internal controls is necessary.

Figure 7
Typical Temperature Controller



5-3 Identifying Process Air Temperature Controller LED Indicators

PV — Process Value Numeric LED

During normal operation, the process value (**PV**) numeric LED indicator displays the process temperature at the **To Process** thermocouple. It also lists parameters during setup and error messages if any errors occur.

SV — Set Value Numeric LED

During normal operation, the set value (**SV**) numeric LED indicator displays the process set point temperature selected for the dryer. The dryer then maintains this set point temperature. This LED indicator also displays parameter and pre-set function values during configuration setup.

OUT1 - Lit when Control Output 1 is on.

The **Out1** indicator lights when the controller signals the process heaters to be energized.

OUT2 - Lit when Control Output 2 is on.

Not used in this application.

AT - Flashes during auto-tuning in process value (PV) screen.

Press and hold the beige Level Key (for 1 second) when the controller is in default mode and the set value will flash. Press the up  and down  keys to set the values.

ALARM1 - Lights in the Operation Indicator Section when the output function assigned to auxiliary output 1 turns on.

The **ALARM1** indicator lights when the process temperature exceeds the set point temperature by more than the alarm deviation value. Alarm output de-energizes the heaters. Heaters re-energize when the temperature falls within the acceptable range.

5-4 Identifying Temperature Controller Keys

 **Mode Key**

Press the  Mode key to shift the display to the next set of parameters. The menu screen displays.

 **Down Key**

Press the  Down arrow key to lower the process air set point temperature. During setup, it lets you decrease the value of the parameter displayed on the set point LED readout.

 **Up Key**

Press the  Up arrow key to raise the process air set point temperature. During setup, it lets you increase the value of the parameter displayed on the set point LED readout.

5-5 Setting the Process Air Temperature

When setting the process air temperature, consult with the resin manufacture for the recommended drying temperature.

To change the process air temperature set point with the dryer running:

- Press  to raise the set point to the temperature you want.
- Press  to lower the set point to the temperature you want.

5-6 Restoring the E5CN Temperature Controller to Factory Setup

If the preset parameters on the controller have been tampered with and it no longer properly controls temperature and displays dew point, you can restore the controllers to the factory setup. ***Call the Service Department at AEC for detailed instructions.***

E5CN Operating Parameters

The E5CN controller has several mode selections. Within each mode are numerous parameters that can be set.

The factory at AEC sets the security level to protect the critical parameters from being accidentally changed. Below is an explanation of the operating modes you will have access to and the AEC default settings.

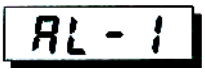
Available E5CN Modes

Operation Level

Run/Stop Mode (r-S)

When "RUN" is selected, the control is running. When "STOP" is selected, the control is stopped. When the control is stopped, the STOP display lights. The default is set to "RUN."

Alarm Value 1 Mode (AL-1)



This setting is used to indicate how many degrees the process temperature will be allowed to exceed the set point temperature. An alarm output will de-energize the heaters.

Adjustment Level

Auto-Tune Mode (At)

This feature is used to automatically set the optimum PID parameters "proportional band," integral time" and "derivative time" for the set point value by changing the variables which had been modified previously.

Note: *Although the controller is calibrated at the factory, AEC recommends that the unit be Auto-Tuned prior to dryer startup.*

Temperature Input Shift Mode (TnS)

This setting is used to offset an error between the set point and the actual temperature. The entire input range is shifted by a set figure preprogrammed by the operator.

Proportional Band Mode(P)

This setting controls the amount in which the manipulated variable (**MV)** is proportionate to the deviated value or controller error.

Integral Time Mode (I)

Setting this feature, gives the control an action that is proportionate to the time integral of the control error. By using this setting, proportional action is used in combination with integral action to offset the control error and the set point will begin to match the control temperature (**PV** or process value).

Derivative Time Mode (d)

Setting the derivative control provides the controller with the ability to correct for a future error in the previously set process output.

Entering Operating Parameters to Select Modes

To enter the display:

3. Press the  Mode Display key to view the Run/Stop & Alarm 1 Modes.
4. Press  and  to set the higher or lower the values of the parameter or turn that function On or Off.

   The **SV** readout displays the different values for the parameter within a mode.
5. To switch modes within a level, press and hold the  Level Display key for one (1) second.

   The **PV** readout will display the different parameters within each mode.
6. Use short presses on the  Mode Display key to display each parameter within a mode.

   The **SV** readout displays the different values for the parameter within a mode.

7. Press  and  to set the higher or lower the values of a parameter or turn that function On or Off.

8. Press  Level Key once to return to the Process Temperature Setting.

Figure 8
Setting List for Process Temperature Controller (E5CN), Part No. A0555757

Mode	Parameter	Setting range	Default	AEC setting
Operation	Run/Stop	Run/Stop	Run	-
Operation	Alarm value 1	-1999 to 9999	0	25

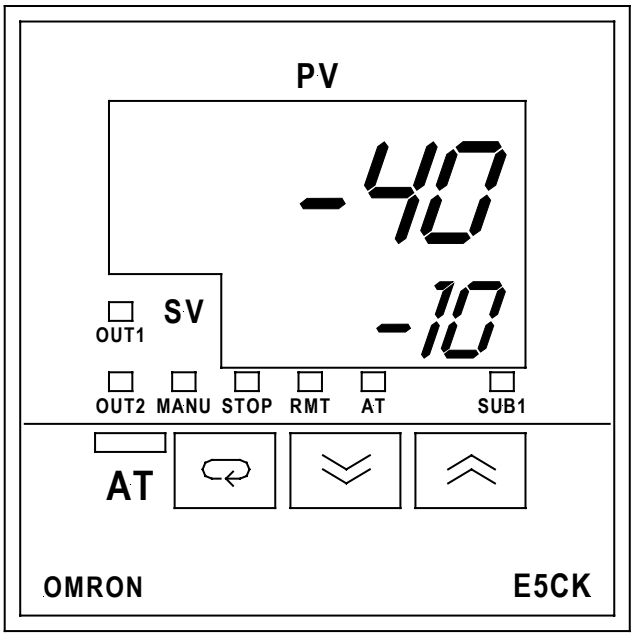
Mode	Parameter	Setting range	Default	AEC setting
Adjustment	AT execute/cancel	ON, OFF	OFF	?
Adjustment	Temperature input shift	-199.9 to 999.9	0.0	-
Adjustment	Proportional Band	0.1 to 999.9	8.0	?
Adjustment	Integral Time	0 to 3999	233	?
Adjustment	Derivative Time	0 to 3999	40	?

5-7 Process Air Dew Point Display

Optional

The Process Air Dew Point meter indicates the current process air delivery moisture content. Standard AEC dryers use a microprocessor-based controller for displaying dew point air temperature. The controller is a modular, self-contained unit removable from the mounting housing. All parameters are factory set and adjusted; normally, no field adjustment to the internal controls are necessary.

Figure 9
Typical Dew Point Display Monitor



(**Note:** The only functional buttons on this contoller are the up and down keys.)

5-8 Setting the High Dew Point Alarm

The high dew point alarm setting is changed by pressing the up and down keys to input the alarm value. The factory setting for Alarm Value 1 *(AL-1)* is -10°F (-23°C).

5-9 Restoring the E5CK Dew Point Meter to Factory Setup

If the preset parameters on the controller have been tampered with and it no longer functions properly, call the Service Department at AEC. ***This controller is not meant to be modified.***

Note: The dew point alarm monitors and indicates a deviation from the set point.

5-10 Redundant Safety Controller Display

Optional

The Redundant Safety Controller limits the process air temperature from exceeding the upper temperature range set by the E5CN Temperature Controller. Standard AEC dryers use a microprocessor-based controller for limiting the process air temperature. The controller is a modular, self-contained unit removable from the mounting housing. All parameters are factory set and adjusted; normally, no field adjustment to the internal controls are necessary.

Figure 10
Typical Redundant Safety Controller Display

5-11 Setting the Redundant Safety Controller

The Redundant Safety Controller alarm setting is changed by pressing the up and down keys to input the alarm value. The upper display reading indicates the Process Value, while the lower display indicates the High Point Setting alarm value. The factory setting for the High Point Alarm Value *(L1-HI)* is 150°F (-23°C).

5-12 Restoring the WATLOW Redundant Safety Controller to Factory Setup

If the preset parameters on the controller have been tampered with and it no longer functions properly, call the Service Department at AEC. ***This controller is not meant to be modified.***

WATLOW Operating Parameters

The WATLOW controller has only one mode selection; ALARM.

The factory at AEC sets the security level to protect the critical parameters from being accidentally changed. Below is an explanation of the modes you will have access to and the AEC default settings.

Entering Operating Parameters to Select Modes

To enter the display:

1. Press both the Up  and Down  keys for three seconds from the home page. The word **SEE** will appear in the upper display and **PAGE** will appear in the lower display.
2. Press the Advance Key  to move through the parameter prompts.
3. Press the Up  or Down  keys to change the parameter value.
4. Press the RESET Key at any time to return to the Home Page display.

Figure 11
Setting List for Redundant Safety Controller (WATLOW), Part No. A0555757

Mode	Parameter	Setting range	Default	AEC setting
SEn	Sensor Type	0-3	0	-
Lin	Thermocouple Linearization	0-10	0	H (1)
C-F	Temperature Units	Fahrenheit / Celsius	F	-
S.dEC	Temp. Decimal Places	0 – 0.0	0	-
IS.En	INFOSENSE™	Yes / No	No	-
Sc.Lo	Process Scale Low	4.00 to 20.00 mA 1.00 to 10.00V	4.00 mA 1.00V	0
Sc.hi	Process Scale High	4.00 to 20.00 mA 1.00 to 10.00V	20.00 mA 5.00 V	400
CAL	Calibration Offset	-999 to 999	0	-
Ftr.E	Input Filter	Off, DiSP, Cont, both	OFF	-
Ot 1	Output 1 Function	Limit (2)	(2)	-
LSd1	Output 1 Limit Sides	Both, High, Low	Both	High
hyS1	Limit 1 Hysteresis	0.0 to 999.0	1.0	-
Ot2	Output 2 Function	Off / Process Alarm / Limit (2)	OFF	-
LSd2	Output 2 Sides	Both / high / low	Both	-
UdSP	Upper Display Look	None, Process Value, Limit 1 Low Set, Limit 1 High Set, Limit 2 Low Set, Limit 2 High Set, Alarm 2 Low Set, Alarm 2 High Set, Limit 3 Low Set, Limit 3 High Set, Alarm 3 Low Set, Alarm 3 High Set	Process	-
LdSP	Lower Display Look	None, Process Value, Limit 1 Low Set, Limit 1 High Set, Limit 2 Low Set, Limit 2 High Set, Alarm 2 Low Set, Alarm 2 High Set, Limit 3 Low Set, Limit 3 High Set, Alarm 3 Low Set, Alarm 3 High Set	Limit 1 High Set	-
LOC	Lockout	(0) no lockout, (1) Programming and Setup Page Locked, (2) Limit Set Points are the only Operation Page parameters accesible, (3) Full Lockout.	0	2

6-1 Controller Operation

(Without Optional Alarm Horn & Reset Button)

1.) Turn the disconnect on the control panel to the **ON** position. Power is applied to the voltage line fuses, line side of the control power switch and the temperature controller.

2.) Turn the control power switch to the **ON** position. Power is applied to the programmable relay and dew point controller.

Note: The relay screen which contains the Alarm Display Messages is located inside the controller enclosure. For a list of Alarm Display Messages, see Section 6-3 on Page 49.

WARNING!

Do not attempt to check the Alarms on the Controller located within the unit enclosure unless you are a qualified electrician!

3.) Once the control power is on and no fault conditions exist, turning the OFF-ON-START switch to the START position will start the dryer as follows:

3-1. The process heater is turned on and controlled by the E5CN controller.

3-2. The solenoid valve opens and air flows through the dryer.

4.) If the OMRON controller faults, the optional redundant high temperature safety device opens, or the process heater safety switch opens, a heater fault is generated. **"HIGH TEMP"** is displayed on the relay screen. The alarm horn and light are activated. The process heater and solenoid valve are turned off.

Turn the OFF-ON-START switch to the START position to deactivate the alarm light and restart the dryer. If the fault condition still exists, the dryer will not restart.

5.) If the pressure in the system drops below 15 PSI for 10 seconds or more, the alarm will sound. The process heater and solenoid valve will shut off.

6.) When no fault conditions exist, the display reads "**SYSTEM NORMAL**".

7.) When a dew point fault is generated by the optional dew point controller, the alarm horn and light will activate. The alarm light will flash, indicating a non-critical fault. Press Alarm Reset to deactivate the alarm until the next dew point fault occurs.

8.) The dryer is shut off by turning the control power switch to the OFF position.

9.) Refer to Schematic drawing A0566087 enclosed in the control enclosure.

6-2 Controller Operation

(With Optional Alarm Horn & Reset Button)

1.) Turn the disconnect on the control panel to the **ON** position. Power is applied to the voltage line fuses, line side of the control power switch and the temperature controller.

2.) Turn the control power switch to the **ON** position. Power is applied to the programmable relay and dew point controller. The solenoid will move to the start position as follows:

2-1. The solenoid opens and air begins to flow. The heaters are also activated.

Note: The relay screen which contains the Alarm Display Messages is located inside the controller enclosure. For a list of Alarm Display Messages, see Section 6-3 on Page 49.

WARNING!

Do not attempt to check the Alarms on the Controller located within the unit enclosure unless you are a qualified electrician!

3.) Once the control power is on and no fault conditions exist, turning the Off-On-Start switch to the START position will start the dryer as follows:

3-1. The process heater is turned on and controlled by the E5CN controller.

4.) If the OMRON controller faults, the optional redundant high temperature safety device opens, or the process heater safety switch opens, a process heater fault is generated. **"HIGH TEMP"** is displayed on the relay screen. The alarm light is activated. The process heater, regen heater, and process/regen blower are turned off. Pressing the ALARM RESET pushbutton will deactivate the alarm horn and light.

Turn the Off-On-Start switch to the START position to restart the dryer. If the fault condition still exists, the dryer will not restart.

5.) When no fault conditions exist, the display reads "**SYSTEM NORMAL**".

6.) When a dew point fault is generated by the optional dew point controller, the alarm light will activate. The alarm light will flash, indicating a non-critical fault. Press Alarm Reset to deactivate the alarm until the next dew point fault occurs.

7.) The dryer is shut off by turning the control power switch to the OFF position.

8.) Refer to Schematic drawing A0566087 enclosed in the control enclosure.

6-3 Alarm Display Messages

Note: The relay screen which contains the Alarm Display Messages is located inside the controller enclosure.

WARNING!

Do not attempt to check the Alarms on the Controller located within the unit enclosure unless you are a qualified electrician!

The following is a list of Alarm Display Messages which can be found on the relay screen:

Temperature Controller Alarm and/or Regen Heater Temp Switch and/or Process Heater Temp Switch and/or Redundant Temp Safety	HIGH TEMP FAULT
Insufficient Air Pressure to Run Unit Alarm	AIR PRES SW
Multiple Alarms	HIGH TEMP FAULT
No Alarms	SYSTEM NORMAL

7-1 Pre-Startup Checks

- ☑ Check the process and return hoses for tight connections.
- ☑ Check all companion equipment, such as the drying hopper; verify that the loading system is ready for operation.
- ☑ Verify that all dryer electrical connections are tight.

Important!

Clean the rust-preventing oil from inside the drying hopper.

Failure to clean the hopper fouls the desiccant and *voids your warranty!*

7-2 Starting Up the Dryer

9. Turn on (energize) the disconnect switch in your power drop, then turn on the one on the dryer.
10. Turn the system **ON/OFF** switch to **ON** to energize the display panel.
11. Close the slidegate at the bottom of the drying hopper.
12. Fill the drying hopper with material.
13. Turn the dryer **ON** switch to **START** to start the dryer.

    Heaters turn on and solenoid opens.
14. Set the process set point on the temperature controller.
15. After the proper pre-drying time for the initial hopper fill has elapsed, fully open the drying hopper slide gate.

Note: To allow proper residence time during continuous processing, maintain the material level in the hopper at the midpoint of the air trap assembly.

7-3 Shutting Down the Dryer

16. When processing is complete, close the hopper slide gate and shut down any in-line companion equipment.
17. Turn the Dryer **ON/OFF** selector switch to **OFF.**
18. Turn the system **ON/OFF** switch to **OFF**.
19. If needed, empty the drying hopper.
20. For maintenance or a long term shutdown, open (de-energize) the electrical disconnects at the dryer and at the power drop.

8-1 Work Rules

The installation, operation, and maintenance of this equipment is to be conducted in accordance with all applicable work and safety codes for the installation location. This may include, but is not limited to, OSHA, NEC, CSA, and any other local, national, and international regulations.

In addition, you must observe the following specific work rules:

- ☑ Keep these operating instructions on hand and follow them when installing, operating, or maintaining your dryer.
- ☑ If the instructions become damaged or unreadable, you can obtain additional copies from AEC.
- ☑ Only qualified personnel familiar with this equipment should work on or with this unit.
- ☑ Work only with approved tools and devices.
- ☑ Disconnect power before servicing your dryer. If the disconnect switch you installed has a lockout, lock it in the **OFF** position before you perform any maintenance or service.

8-2 Servicing Process Air Filters

Important!

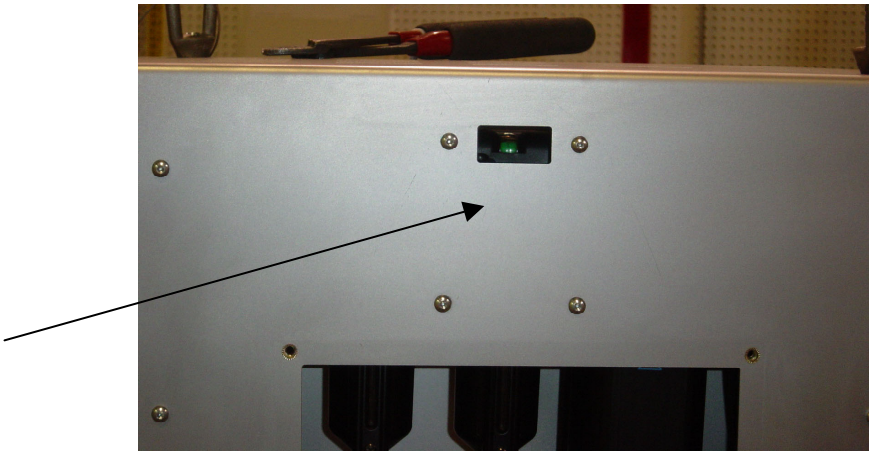
Operating the dryer without the process air filter installed voids your warranty!

Filter cleaning is an important part of your dryer maintenance program.

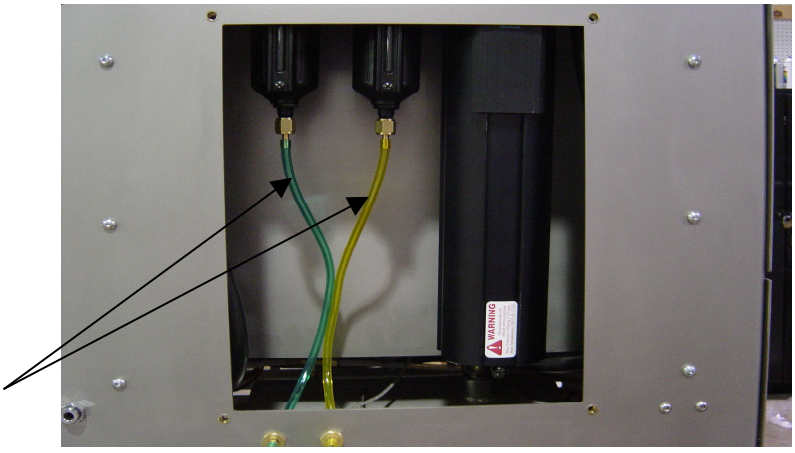
ACM dryers have two compressed air filters in the process air system. The filters protect the membrane oil particles. Regular filter cleaning is essential to keep your dryer operating at peak efficiency.

Recommendations for Cleaning and Replacing Filters

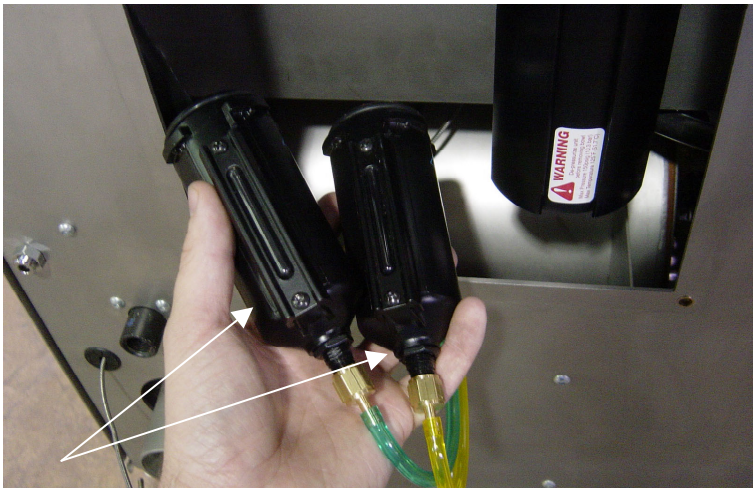
1. Turn off and/or lock out electrical power to the dryer.
2. Remove the back access cover.



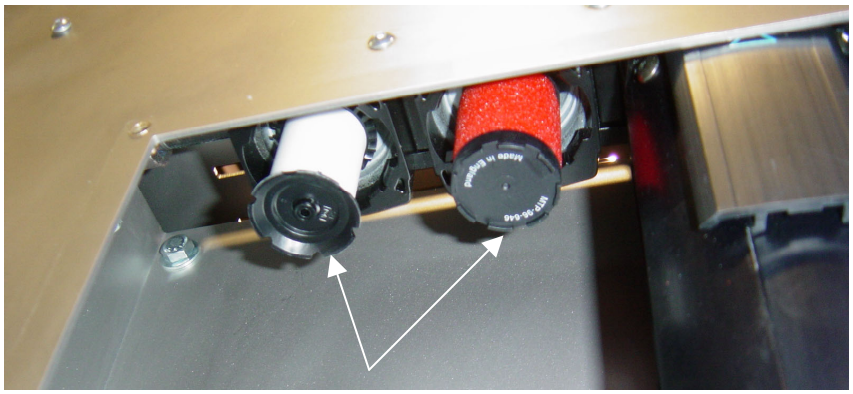
3. Locate the 2 compressed air hoses and filter bowls connected to the filters.



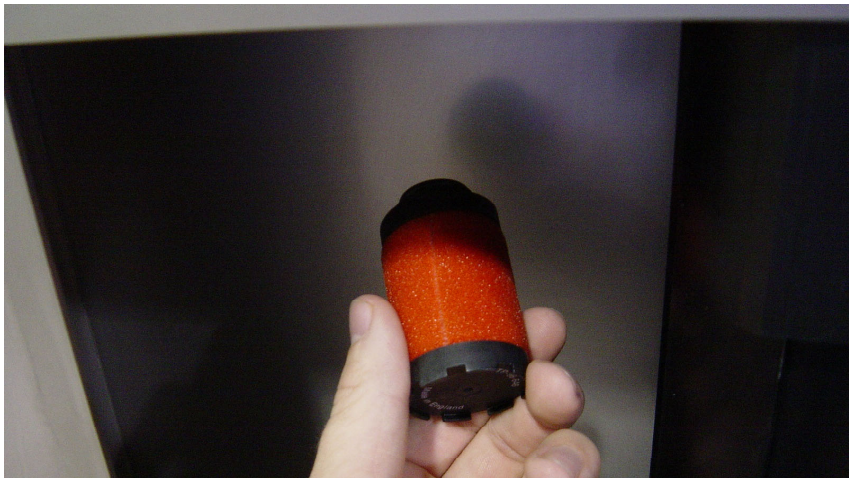
4. Remove the filter bowls



5. Locate filters.



6. Remove the filters.



7. Blow particulate filter out with compressed air.
8. Replace coalescing filter with new element.

- Reassmble in the opposite order of disassembly

Cleaning with Compressed Air

Blow clean, dry compressed air up and down the pleats, blowing out the filter from the inside out. Remove loose dirt from the filter with compressed air or vaccum from the outside.

Important!

DO NOT clean/wash filter with water!

After each cleaning:

- Inspect the filter element. *Briefly* hold a light bulb behind the element and look for any **fatigued paper** or residual dirt.

Inspect for holes and tears by looking though the filter toward a bright light. Check for damaged gaskets or dented metal parts. Do not re-use a damaged filter!

- Check the gasket for damage. A damaged gasket allows contaminants into the process. Replace as needed.

8-3 Servicing the Dew Point Monitor

The accuracy of the dew point monitor on mini dryer systems depends on proper operation of the dew point sensor and the control board. The dew point sensor is in the process air stream and is therefore susceptible to contamination.

Dew point sensor life depends on:

- Air temperature and flow passing over the sensor.
- The amount of fines (dust) in the process air.

Once every six months, the dryer operator should monitor the initial dew point sensor readings and establish a periodic replacement schedule as needed.

CAUTION!

Do not attempt to check the continuity or resistance of the dew point sensor.

The sensor will be destroyed!

8-4 Replacing the Process Heater

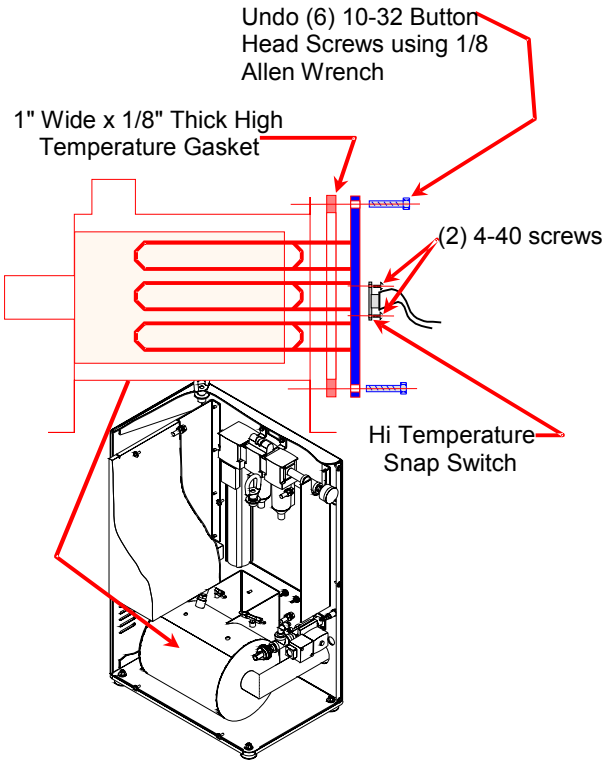
The ACM Series dehumidifying dryers utilize a single-phase Calrod-type heater element. This heater element is mounted in the center compartment below the desiccant beds. Although the replacement procedure is the same for each heater, the wattage varies by model, voltage, temperature range, etc.

WARNING!

HAZARDOUS ELECTRICAL CURRENT PRESENT.

Disconnect and lock out power *before* you replace heater elements!

Figure 12
Process Heater Location and Disassembly



Procedures

1. Remove the four (4) 10-32 button head screws securing the process heater access cover using a 1/8” Allen wrench.
2. Sketch the heater wiring configuration so you can properly re-wire the heater.
3. Remove the wires to the heater plate assembly being removed or replaced.
4. Remove the two (2) 4-40 screws securing the heater plate assembly, and slide out the assembly.
5. Remove the heater from the mounting plate by removing the large brass nuts and washers.
6. Re-install the heater and heater plate assemblies in reverse order. Install new heater gaskets and securely tighten all fasteners.

CAUTION!

Heater loops should not touch each other.

“Hot spots” lead to premature heater failure!

7. Reinstall the wires based on the sketch you made earlier.

Preventive Maintenance Checklist

AEC ACM Dehumidifying Dryers

System model #	Serial #

Every week	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By
Inspect all filters for wear, replace/ clean if dirty or worn.													
Check to make sure that all hose conections are air tight.													

Every month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lock out electrical power and inspect electrical wiring for integrity.												
Lock out electrical power and check heater elements for continuity using an ohmmeter.												
Check dew point and temperature tracking with an external dew point monitor and pyrometer.												

- Photocopy this page for your maintenance records -

Problem	Possible cause	Corrective action
Loss or reduction of process air temperature.	Process heaters are faulty.	Check for open heaters. Replace if required.
	Solid-state temperature controller faulty.	Replace.
	Process temperature was adjusted in error by plant personnel.	Make sure that plant personnel are aware of the proper temperature set point. Post an appropriate sign next to the controller.
Loss or reduction in drying capacity.	Process heaters are faulty.	Replace.
	Material being dried differs from material specified at the time of purchase.	Drying systems are designed for the material which was originally specified. Different materials may need a longer residence time or a different drying temperature.
	Break in flex hose to/from drying hopper.	Inspect for air leaks; replace as needed.
PLC Regeneration Bed LED indicators both off.	Insufficient power to PLC (Power LED is off).	Check power supply and power wiring to PLC.
	Faulty PLC (PLC Power light is on, Run light is off, and/or Error light is on).	Replace PLC.
PLC Regeneration Heater Left/Right output indicators both off.	Regenerating bed cooldown.	None.
	Blower Input indicator is off.	Verify that blower contactor is on. Check input wiring to PLC.
	Process air in high-temperature condition.	None.
	Insufficient power to PLC (Power light is off).	Check power supply and power wiring to PLC.
	Faulty PLC (PLC Power light is on, Run light is off, and/or Error light is on).	Replace PLC.

Problem	Possible cause	Corrective action
Material in drying hopper cakes, or meltdown occurs.	Process temperature set too high due to operator error.	Check resin manufacturer's data sheet for proper drying temperature. Make sure plant personnel are aware of the correct process temperature set point.
	High temperature alarm not set properly.	Reset high temperature alarm.
	Process set point is out of acceptable range.	Restore temperature controller to factory pre-sets.
	Function set for degrees Celsius (ºC), set point at degrees Fahrenheit (ºF).	Verify correct Celsius or Fahrenheit settings.
	Process thermocouple not in airflow.	Verify that the thermocouple is properly installed in the inlet tube.
Poor dew point performance.	Burned out regeneration heater.	Repair or replace.
	Leaking process air hoses.	Repair or replace.
	Dryer operates beyond its capacity.	Check dryer and drying hopper sizing.
	Bad dew point sensor.	Replace.
	Fouled dew point sensor manifold.	Clear obstruction. Air should flow freely through sensor.
	Coalescing filter saturated.	Replace with new element.
	Large particle filter dirty.	Remove and clean.
	Membrane contaminated.	Replace.
Nothing displays when the controller is turned on.	The internal mechanism is not inserted properly into the housing.	Properly insert the internal mechanism into the housing.
	The power supply is not connected to its terminals properly.	Properly connect the power supply to the power supply terminals.
	No power is supplied, or the supplied power is not within the specified range.	Supply a voltage of 85 to 125 VAC to the power supply terminals of the controller.
	Disconnect switch or Control Power switch not set to **ON**. Control Power fuse blown.	Check control power fuse for continuity. Turn disconnect switch and control power switch **ON**.
No setting change possible on temperature controller.	The key protection switch is set to **ON**.	Set the key protection switch to **OFF**.

Problem	Possible cause	Corrective action
Process value is abnormal or not obtained.	Input polarity on thermo-couple is wrong or connection is wrong.	Properly wire the terminals.
	Input-type setting is incorrect.	Properly set the input with the input-type selector rotary switch.
	No compensating lead wires used for extension of the thermocouple.	Use proper compensating lead wires and terminals.
	Thermocouple and controller are connected by wires other than proper lead wires.	Use a dedicated thermocouple connector. If a connector is a metal different from the thermocouple and controller, a temperature error may result.
	Process thermocouple not in airflow.	Verify that the thermocouple is properly installed in the inlet tube.
	Sensor is broken or short-circuited.	Replace with a good sensor.
	The controller is influenced by noise or other induction.	Separate input wires as far as possible from the origin of the noise.
	Celsius temperatures used instead of Fahrenheit or vice versa.	Check Mode selector switch **6**: • ON - ºF • OFF - ºC
	Process value shifted because the input shift function is used.	Set input shift value to **0**, or set mode selector switch **4** to **OFF**.

Determining Temperature Controller Errors or Sensor Errors

Using a Thermocouple

If the controller displays a temperature that is close to room temperature (70ºF/21ºC) when you short-circuit controller input terminals, the controller is normal and the sensor is probably broken, short-circuited, or incorrectly wired.

Using a Platinum Resistance Thermometer

If the controller displays a temperature of about 0.0°C (32ºF) when you insert a 100-ohm resistor between terminals **A** and **–B** of the controller, and you short-circuit controller terminals **+B** and **–B**, the controller is normal and the sensor is probably broken, short-circuited, or incorrectly wired.

Other service problems or questions can be answered by contacting the AEC Service Department.

Dryer Options *10*

The following is a list of options, which your Dryer may have been equipped with:

- ***Dew Point Monitor***
- ***Audible Alarm with Silence Button***
- ***High Temperature Option (with Aftercooler)***
- ***Casters***
- ***AP1 PLC Control System***

11-1 Spare Parts List

ACM Series Dehumidifying Dryers

Figure 14
Level 1 Spare Parts List
(Electrical & Mechanical)

MINI DRYER SPARE PARTS LIST ACM30, ACM60

PART #	SIZE	Description	30CFM 208V 3PH	30CFM 220V 50 HZ 3PH	30CFM 230V 3PH	30CFM 400V 50 HZ 3PH	30CFM 460V 3PH	30CFM 575V 60 HZ 3PH	60CFM 208V 3PH	60CFM 220V 50 HZ 3PH	60CFM 230V 3PH	60CFM 400V 50 HZ 3PH	60CFM 460V 3PH	60CFM 575V 60 HZ 3PH
LEVEL 1 (Electrical Components)														
A0568932	2	Fuse for the Heater Elements												
A0568933	2.5	Fuse for the Heater Elements												
A0568934	3	Fuse for the Heater Elements						3						
A0534039	3.5	Fuse for the Heater Elements					3							
A0534040	4	Fuse for the Heater Elements				3								
A0534041	5	Fuse for the Heater Elements						3						
A0534042	6	Fuse for the Heater Elements					3							3
A0534043	7	Fuse for the Heater Elements			3	3							3	
A0534044	8	Fuse for the Heater Elements	3	3								3		
A0534046	10	Fuse for the Heater Elements												3
A0534047	12	Fuse for the Heater Elements			3								3	
A0534048	15	Fuse for the Heater Elements	3	3						3	3	3		
A0534049	20	Fuse for the Heater Elements							3					
A0568936	25	Fuse for the Heater Elements								3	3			
A0434051	30	Fuse for the Heater Elements							3					
A0536892	1.25	Fuse for the transformer						2						2
A0536894	1.6	Fuse for the transformer					2						2	
A0536895	1.8	Fuse for the transformer				2						2		
A0538001	3.2	Fuse for the transformer		2	2					2	2			
A0538002	3.5	Fuse for the transformer	2						2					
A0568941	2.8	Fuse for the transformer												
LEVEL 1 (Mechanical Components)														
W00015435		Dew Point Sensor Insert Cable	1						1					
A0548556		Dew Point Sensor	1						1					
A0568459		Coalescing Filter Element	1						1					
A0568458		Particulate Air Filter Element	1						1					
A0566859		Membrane Air Dryer	1						2					
W00013983		High Temperature Gasket.	25 Inches						25 Inches					
A0566676		High Temperature Snap Switch.	1						1					
A0568009		Pressure Switch	1						1					
A0556547		Solinoid Valve	1						1					
A0566682		Dew Point Sample Hose 1/4" O.D. Teflon Tube	3 ft						6 ft					
A0568008		Compressed Air Hose	3 ft						6 ft					

Figure 15
Level 2 & 3 Spare Parts List
(Electrical & Mechanical)

MINI DRYER SPARE PARTS LIST ACM30, ACM60

LEVEL 2 (Electrical Components)

PART #	SIZE	Description	30CFM 208V 3PH	30CFM 220V 50 HZ 3PH	30CFM 230V 3PH	30CFM 400V 50 HZ 3PH	30CFM 460V 3PH	30CFM 575V 60 HZ 3PH	60CFM 208V 3PH	60CFM 220V 50 HZ 3PH	60CFM 230V 3PH	60CFM 400V 50 HZ 3PH	60CFM 460V 3PH	60CFM 575V 60 HZ 3PH
A0530042		Mercury Heater Contactor	1						1					
A0567917		Process Air Temperature Controller	1						1					
A0544089		Regeneration Air Temperature Controller	1						1					
A0558065	*	Dew Point Monitor	1						1					
A0548555	*	Dew Point Circuit Board	1						1					
A0505417		Regeneration T'Couple Relay	1						1					

LEVEL 2 (Mechanical Components)

PART #	SIZE	Description	30CFM 208V 3PH	30CFM 220V 50 HZ 3PH	30CFM 230V 3PH	30CFM 400V 50 HZ 3PH	30CFM 460V 3PH	30CFM 575V 60 HZ 3PH	60CFM 208V 3PH	60CFM 220V 50 HZ 3PH	60CFM 230V 3PH	60CFM 400V 50 HZ 3PH	60CFM 460V 3PH	60CFM 575V 60 HZ 3PH
A0548621		Ceramic Cap for the End of Heater Elements	6						6					
A0566483		1250 Watts Heater Element 208/220 Volts	3	3					0	0				
A0566484		1250 Watts Heater Element 230 Volts			3						0			
A0566485		1250 Watts Heater Element 400 Volts				3						0		
A0566486		1250 Watts Heater Element 460 Volts					3						0	
A0566487		1250 Watts Heater Element 575 Volts						3						0
A0566601		2500 Watts Heater Element 208/220 Volts	0						3	3				
A0566602		2500 Watts Heater Element 230 Volts	0								3			
A0566603		2500 Watts Heater Element 400 Volts	0									3		
A0566604		2500 Watts Heater Element 460 Volts	0										3	
A0566605		2500 Watts Heater Element 575 Volts	0											3
A0566415		Washer / Gasket for the Heater Elements	6						6					

MINI DRYER SPARE PARTS LIST ACM30, ACM60

LEVEL 3 (Electrical Components)

PART #	SIZE	Description	30CFM 208V 3PH	30CFM 220V 50 HZ 3PH	30CFM 230V 3PH	30CFM 400V 50 HZ 3PH	30CFM 460V 3PH	30CFM 575V 60 HZ 3PH	60CFM 208V 3PH	60CFM 220V 50 HZ 3PH	60CFM 230V 3PH	60CFM 400V 50 HZ 3PH	60CFM 460V 3PH	60CFM 575V 60 HZ 3PH
A0567921		Power Disconnect	1						1					
A0566096		Mitsubishi Programmable Relay Logic Controller	1						1					
A0568961		Redundant Temperature Safety Controller	1						1					

LEVEL 3 (Mechanical Components)

PART #	SIZE	Description												
A0534059		2" O.D. by 12 Ft Long Hi Temp Hose.	1						1					
A0534060		2-1/2" O.D. by 12 Ft Long Hi Temp Hose.	1						1					
W00015335		Dew Point Sensor Manifold	1						1					
A0548558		Gasket for the Dew Point Sensor	1						1					
W00015436		Plastic Nut for the Dew Point Sensor	1						1					
A0568022		Rubber Bumper for the bottom of Dryer	4						4					
A0568023		Swivel Casters without Brakes	2						2					
A0568024		Swivel Casters with Brakes	2						2					

12-1 Contact Information for Technical Assistance

Parts Department

Call toll-free 7am–5pm CST [800] 423-3183 or call [630] 595-1060, Fax [630] 475-7005

The ACS Customer Service Group will provide your company with genuine OEM quality parts manufactured to AEC engineering design specifications, which will maximize your equipment's performance and efficiency. To assist in expediting your phone or fax order, please have the model and serial number of your unit when you contact us. A customer replacement parts list is included in this manual for your convenience. ACS welcomes inquiries on all your AEC parts needs and is dedicated to providing excellent customer service.

Service Department

Call toll-free 8am–5pm CST [800] 233-4819 or call [630] 595-1060
Emergencies after 5pm CST, call [847] 439-5655

AEC has a qualified service department ready to help. Service contracts are available for most AEC products.

Sales Department

Call [630] 595-1060 Monday–Friday, 8am–5pm CST

AEC products are sold by a world-wide network of independent sales representatives. Contact our Sales Department for the name of the sales representative nearest you.

Contract Department

Call [630] 595-1060 Monday–Friday, 8am–5pm CST

Let AEC install your system. The Contract Department offers any or all of these services: project planning; system packages including drawings; equipment, labor, and construction materials; and union or non-union installations.

AEC, Inc.
801 AEC Drive
Wood Dale IL 60191-1198
[630] 595-1060 • Fax [630] 595-6641

12-2 Returned Material Policy

12-2-1 Credit Returns

1. Prior to the return of any material **authorization** must be given by **AEC, INC.** A RMA number will be assigned for the equipment to be returned.
2. Reason for requesting the return must be given.
3. ALL returned material purchased from **AEC, INC.** returned is subject to 15% ($75.00 minimum) restocking charge.
4. ALL returns are to be shipped prepaid.
5. The invoice number and date or purchase order number and date must be supplied.
6. No credit will be issued for material that is not within the manufacturer's warranty period and/or in new and unused condition, suitable for resale.

12-2-2 Warranty Returns

1. Prior to the return of any material, authorization must be given by **AEC, INC.** A RMA number will be assigned for the equipment to be returned.
2. Reason for requesting the return must be given.
3. All returns are to be shipped prepaid.
4. The invoice number and date or purchase order number and date must be supplied.
5. After inspecting the material, a replacement or credit will be given, at **AEC's** discretion. If the item is found to be defective in materials or workmanship, and it was manufactured by **AEC, INC.,** purchased components are covered under their specific warranty terms.

12-3 Warranty

AEC, Inc. warrants all equipment manufactured by it to be free from defects in workmanship and material when used under recommended conditions. The Company's obligation is limited to repair or replace FOB the factory any parts that are returned prepaid within one year of equipment shipment to the original purchaser, and which, in the Company's opinion, are defective. Any replacement part assumes the unused portion of this warranty.

This parts warranty does not cover any labor charges for replacement of parts, adjustment repairs, or any other work. This warranty does not apply to any equipment which, in the Company's opinion, has been subjected to misuse, negligence, or operation in excess of recommended limits, including freezing or which has been repaired or altered without the Company's express authorization. If the serial number has been defaced or removed from the component, the warranty on that component is void. Defective parts become the property of the warrantor and are to be returned.

The Company is not liable for any incidental, consequential, or special damages or expenses. The Company's obligation for parts not furnished as components of its manufactured equipment is limited to the warranty of the manufacturers of said parts.

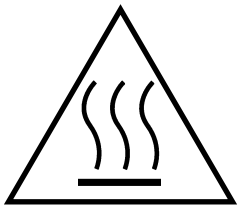
Any sales, use, excise, or other tax incident to the replacement of parts under this warranty is the responsibility of the purchaser.

The company neither assumes nor authorizes any other persons to assume for it any liability in connection with the sale of its equipment not expressed in this warranty.

Many types of AEC, Inc. equipment carry an additional one-year service policy. Consult your AEC sales representative for specific details.

-Notes-

13-1 ACM Dryer Safety Tags



Hot!

Read Operation and Installation Manual

High Voltage Inside Enclosure

Earth Ground

Lifting Point

Protected Earth Ground

13-2 Dryer Identification (Serial Number) Tag

(Located on back of Dryer)

CE

ACM Series Dryer
Model Number ACM-030
Max Drying Capacity HR

460V **Serial Number 060701R**
1Ø **Date of Manufacture 06/2003**
4.5A
Over-current Protection Device (s) 4.5A Total
Frequency 50/60Hz
Compressed air supply None

Dryer Mass 400 lbs/(180 KG)
Electrical Diagrams &
Pneumatic Diagram

801 AEC Drive **Wood Dale, Illinois USA**
(630) 595-1060

Service Notes

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